Abstract of the Disclosure

An integrated sensor for automated systems includes a flow sensor, a temperature sensor, a pressure sensor, and a network interface. In a particular embodiment of the invention, the flow sensor includes a temperature sensor (26) which determines the temperature of the fluid flowing in a flow path (12). A heater (18) is coupled to the flow path, and is energized by a controller (20) with sufficient electrical power to raise the temperature of the heater above the measured fluid temperature by a fixed temperature difference. In order to aid in determining the temperature difference, a sensor (24) may be associated with the heater (18). The amount of power required to maintain the temperature difference is a measure of the flow velocity. The volumetric flow rate is the product of the flow velocity multiplied by the area of the flow sensor. The mass flow rate is the product of the volumetric flow rate multiplied by the mass density of the fluid. In a particular embodiment, the pressure sensor is ratiometric.